Heathrow's response to the CAA's draft policy statement on the economic regulation of new capacity

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Section 1: Introduction

The potential for Heathrow to expand its capacity as a result of the deliberations of the Airports Commission (AC) presents an opportunity for Heathrow to play its part in furthering the interests of the users of air transport services. Increased capacity is an exciting proposition that, if matched with an appropriate regulatory framework, can enhance the experience for all stakeholders in the nation's hub airport. In addition to engagement with the CAA, Heathrow has of course continued with its own programme of public engagement and consultation.

There is clearly wide and growing support for Heathrow's proposition.[1]

This document sets out Heathrow's response to the CAA's draft policy on the economic regulation of new runway capacity (Draft Policy Statement). The CAA's paper raises a number of issues many of which could have a significant bearing on the potential development, operation and success of any future airport capacity at Heathrow. We welcome the CAA's draft statement and the on-going consultative approach taken by the CAA.

Heathrow's comments in respect of many of the issues raised in the CAA's draft policy are necessarily high-level but this is not a reflection of Heathrow's view of the absolute or relative importance of certain issues. Moreover, in the event that Heathrow has not raised or addressed a particular issue in this response at this comparatively early stage, it should not be inferred that Heathrow attaches no importance to the matter. We will naturally want to participate fully in the debate going forward, whether or not we have raised an issue here.

As the Airport Commission (AC) process evolves, new information and issues will almost certainly arise. Heathrow is keen to ensure the CAA's process also evolves so that any thinking on regulatory policy captures on-going developments, and the process is sufficiently dynamic to incorporate new information and/or evidence as it emerges. Heathrow's response is therefore non-exhaustive and comments are subject to change.

Relatedly, given the current uncertainty, the CAA's principles-based approach is welcomed and is, in Heathrow's view, the correct approach to adopt. As work progresses with the AC and other stakeholders - through public consultation and other means - more information and analysis will become available helping to further refine Heathrow's proposition for capacity expansion. This on-going process will also help to facilitate understanding and consideration of some of the key components that may potentially be relevant to any future assessment of the need for economic regulation, for example, (types of) risk, operational and environmental issues and the potential scope for passenger outcomes based on commercial settlements.

We encourage the CAA to continue with a consultative and non-determinative approach. It would be premature for the CAA's proposed policy statement - scheduled for Q1 next year - to set out a prescriptive approach on regulation. Notwithstanding the principles-based approach, there remain a number of overarching points that the CAA should take into consideration in developing the final policy statement:

i. Regulatory policy will be central to the AC's thinking and will have a significant influence on the development of additional capacity. However, it will be one of many key issues

[1] The Back Heathrow campaign has more than 50,000 supporters, more than 25 Chambers of Commerce have endorsed Heathrow as their preferred solution, positive engagement is taking place with 4 of our closest Local Authorities with one already supportive of expansion and polling shows that there are more local people in favour of Heathrow expansion than oppose it.

and this is not a regulatory review process. Therefore, while Heathrow clearly recognises that a collaborative approach on any future regulation is required, the CAA and other stakeholders must be careful not to assume that policy development on capacity expansion is simply another form of quinnquennial review.

ii. Despite the current uncertainty, the benefits of capacity expansion at Heathrow are clearly substantial and the expansion of Heathrow represents a far less uncertain prospect for UK passengers relative to Gatwick (GAL).[2] In a context of excess demand and scalability, demonstrable shareholder support and evidence of successful financing and construction of significant infrastructure projects, Heathrow's proposal for expansion poses considerably fewer commercial, regulatory and policy challenges compared to GAL.

iii. If regulatory intervention is required, we are broadly supportive of many of the CAA's draft proposals and suggested approach, such as:

   a. the CAA's scepticism in relation to a split RAB approach,
   b. the CAA's broad support for efficiently incurred capex to be added to the RAB,
   c. the capitalisation of certain opex and
   d. The consideration of extended regulatory periods (possibly with certain elements being fixed over the period).

iv. We also note the CAA's view that pre-funding may be in the users' interests.

v. Heathrow is not persuaded by the CAA's draft proposals on costs and cost-recovery. Our view on this may be summarised as follows:

   a. While Heathrow recognises the merit in adopting a high-level approach at this stage, the CAA's categorisation of costs according to a timeline and broad 'type' is an over-simplification and appears to misunderstand and underestimate the likely nature and scale of certain costs.
   b. Analysis suggests that planning costs alone could be in excess of [✂]. This is some way above the CAA's proposed threshold for *automatically recoverable* costs. The CAA's selection of £10m per annum as an appropriate ceiling for planning costs appears arbitrary and unexplained. The fact that it has previously been acknowledged by GAL as an acceptable figure in its licence is not a rationale for applying it to Heathrow. It is incumbent on the CAA, in proposing any modification to the Heathrow Airport Ltd (HAL) licence, to come up with a robust and transparently calculated figure which is likely to be significantly in excess of £10m.
   c. The CAA's more prescriptive proposals on cost recovery and, in particular, a pre-determination that certain costs should not be recoverable are inconsistent with the CAA's stated preference for a principles-based approach to regulation, and does not sit well with the CAA's stated 'open door policy'. Efficiently incurred costs ought properly to be recoverable via the existing regulatory mechanisms. In respect of category B costs, an alternative would be for the CAA to conduct a properly informed exercise to derive a more realistic figure.

[2] For example, in terms of GDP/GVA impacts these range from £112bn to £211bn at Heathrow relative to £42bn to £127bn at GAL (under different scenarios). Airports Commission, Business Case and Sustainability Assessment, November 2014.

d. The CAA's current approach may also distort commercial negotiations, leading to inefficient outcomes.

The CAA's broad framework of principles provides a suitable platform for analysis and industry discussion. It is in users' interests that industry develops a market-oriented solution, and to the extent that regulatory intervention is required in certain areas, it should be targeted and proportionate. There is sufficient time to enable commercial discussions to take their course and the CAA is right to encourage industry towards a negotiated settlement, against a background of possible regulatory intervention if required.

Finally, while Heathrow welcomes the CAA's intention to give certainty at this stage at a high level, there is clearly a tension between (on the one hand) providing that certainty and (on the other) a potential fettering of discretion. Heathrow would welcome the opportunity to engage in further discussions about this.

This response is structured as follows:

- Section 2 sets out Heathrow's initial views on the CAA's principles based approach. This includes comments on why capacity expansion at Heathrow is in users' interests and how the CAA's regulatory stance might help facilitate capacity expansion in a manner that is in line with its duties whilst not prejudicing commercial freedom.

- Section 3 of the response addresses incentives and risk. In addition to Heathrow's comments on the CAA's draft proposals for cost recovery, we also set out initial views on sculpting depreciation, front-loading and inter-generational transfers.

- Section 4 concentrates on other policy issues, including slot allocation and the mechanisms for recovering costs in Q6, and also sets out comments on the market power assessment (MPA).

- Section 5 of the response provides Heathrow's initial views on a forward-looking timeline with some of the key milestones. It sets out a simple overview of timescales for industry engagement and how these might relate to the CAA's own programme of work.

- Section 6 concludes.

Section 2: The CAA's proposed approach

In the present context of the airport capacity expansion, the CAA might be considered as much a "facilitator" in this process as it is regulator. While maintaining independence and enabling the CAA to meet its statutory duties, it is clearly important that regulation helps give effect to the AC's objectives in respect of connectivity, the UK's hub status and the impact on the wider economy.

The CAA's draft proposals go some way toward facilitating outcomes in the users' interests, for example, by means of encouraging the development of commercial agreements and settlements. Heathrow agrees that commercial outcomes are a means of delivering cost efficiency, effective distribution of risk and could also avoid the need for detailed and/or intrusive regulation. Heathrow therefore broadly welcomes the CAA's draft proposals on commercial negotiation and the 'bandwidth' these provide for industry and wider stakeholder engagement.

However, commercial negotiation will have a greater prospect of success in an environment where all parties to the negotiation have a clear understanding of the CAA's *strategic* aims and the likelihood of future regulatory intervention. In that context, we make the following initial observations.

2.1 Expansion is in the users' interest

Expansion is clearly in the users' interests and we are encouraged to see this noted by the CAA, as it has been by the Government and the Airport's Commission. We agree with the CAA's statement that the scarcity of runway capacity has "seriously damaging" implications for passengers (paragraph 2.21 of the consultation). We are therefore supportive of the statement that any form of regulation should encourage the building of new capacity by ensuring it is financeable.

As noted by Frontier Economics[3], capacity expansion would drive significant benefits for users. For example,

- Ticket prices at Heathrow would be £95 per return ticket or 15% of average fares lower today if there were no constraint;
- By 2030, the fares at Heathrow would be £320 lower in today's prices (or 38% of the average fare) because of the increasing impact of the capacity constraint;
- Reductions in fares outweigh the extra costs to passengers of new capacity, the £320 saving relative to our initial estimate that airport charges average £24 between 2019 and 2049 compared to around £20 currently;
- Ticket prices would fall significantly more from expansion at Heathrow compared to the impact through expansion at a point-to-point airport, as excess demand is substantially higher at Heathrow. Expansion, especially at Heathrow, will increase competition and lead to lower prices across the London Airport system.

Frontier's findings are robust even in different scenarios, including Gatwick emerging as a second hub.

[3] Frontier Economics, The impact of airport expansion on competition and choice, 2014.

2.2 Principles-based approach

We note the CAA's principles-based approach to future economic regulation of the provision of new capacity in the context of the desirability of encouraging commercial/market-orientated outcomes and are supportive of this collaborative approach. We agree that this could incentivise efficiency and avoid any unnecessary regulatory intervention. We also note that the CAA's primary duty is to ensure that decisions are taken in the best interest of users (passengers and cargo carriers).

We support the adoption of principles-based approach. At the moment, however, we consider that the CAA's intended strategy is too prescriptive – it strays from principle into detail. There are clearly risks in adopting this approach both in terms of making errors and in terms of distorting commercial negotiations and investment choices.

In this context, it is essential that the CAA's approach is founded on a proper reading of its primary duty. The CAA's primary duty must be performed with regard to the considerations set out in Section 1(3) of the Act, in particular the need to ensure all reasonable demands for airport operation services are met and the need to secure that each licence holder can finance its provision of airport operation services. It is clear that this duty encompasses an obligation to support a sustainable future as well as a need to consider the interests of existing users. Principle-based, non-prescriptive regulation is, we believe, the better mechanism to adopt at this point to facilitate those goals.

2.3 CAA as a 'facilitator'

We are keen to see the CAA act as a 'facilitator' in relation to commercial negotiations with airlines. We consider that there are clear benefits to all parties – users, airlines, the airport and the regulator – to commercial agreements. The success of such negotiations is critically dependent on the expectations of the parties regarding the prospects for regulatory intervention. If, as proposed, the CAA lets industry try to conclude negotiations, and then conducts a review after a fixed period of time (even one much longer than the six months proposed in the consultation document),[4] there could be very little scope for the parties to agree to anything which departs materially from the outcome expected under the fall-back of regulation.

To gain the benefits from commercial negotiation that the CAA has correctly identified, we believe that the CAA needs to "facilitate" this process. In essence, the CAA needs to set the 'rules of the game' for the negotiation so that each party understands its respective role, and understands how *ex ante* and *ex post* regulation will apply under the various possible outcomes for the negotiation, in order to ensure that efficiently incurred costs of expansion can be recovered either via commercial arrangement or via the regulatory framework in due course.

We believe that there are many different ways in which this could work, including designs that would give strong incentives for the parties to reach an agreement. We do not consider this consultation response is the correct place for these ideas to be developed; but we would welcome the opportunity to discuss options – beyond the existing Constructive Engagement (CE) scheme - with the CAA for how these negotiations might be constructed. Given the scale of the potential benefits of negotiated agreements, we believe that the CAA should look into this further.

[4] See section 5 for Heathrow's initial views on the likely timescales.

2.4 Flexible/Licence backed commercial framework

We agree that such commercial agreements could lead to a flexible/licence-backed, 'light-handed' form of regulation and support this approach. This will require the CAA to be dynamic, but as discussed above the CAA should be mindful that its interventions, both current and planned, may have unavoidable effects on the outcome of negotiations.

One of the main benefits of a commercially negotiated agreement is flexibility. Faced with a wide range of options, negotiation can discover an outcome that is mutually beneficial to the parties and deliver optimal outcomes for users. However, in order to reach this outcome, it is important that the range of options considered is sufficiently broad. Some of the current proposals already limit the scope of potential negotiations - for example, the suggestions that Category A costs should not be recoverable, and that Category B costs might only be partially recoverable.

2.5 Further regulatory intervention

We understand the RAB-based approaches discussed and welcome the debate on appropriate length of price control periods should commercial agreements not prove possible.

Overall, we welcome the CAA's commitment to encourage commercial agreements and, should regulatory intervention be required, to apply proportionate and targeted intervention and to select the least intrusive tool. Any intervention by the CAA will obviously need to take place within the statutory framework and not distort the market or prejudge commercial negotiation.

Section 3: Incentives and risk

The draft policy on cost recovery is overly prescriptive and misunderstands the scale of certain costs. If the CAA is genuinely seeking to encourage expansion (as it is in the users' interests) and to facilitate commercial agreements between airport operators and airlines, then it must ensure that its proposed approach to cost recovery supports these objectives.

The CAA's draft proposals to break costs into three categories, with clear definitions about what will and will not be recoverable, risk interfering with the ability of interested parties to secure genuine commercial agreements. This approach is likely, therefore, to have a detrimental impact on efficiency, risk taking and possibly the incentive to proceed with expansion.

It is also important to note that some of the CAA's draft proposals on costs are either counter-intuitive or directly contradictory, for example the timing of planning related costs means they must fall in Category A, even though they are undoubtedly equivalent to the definition of Category B costs in all but the timing of spend.

3.1 Balance of incentives and proposed approach

Whilst the detail of the policy on cost recovery is clear, it is unclear how it fulfils the CAA's stated objective of encouraging commercial agreements. By categorising costs as they have, the proposals potentially limit the opportunity for airport operators and airlines to reach all-encompassing agreements as they immediately exclude Category A costs from being recoverable. Further, the proposals imply a limited risk to airlines for Category B costs in the event that planning approval is not granted, rescinded or withdrawn. Not only does this place unfair risk on the airport operator, but it also misunderstands the potential scale of costs associated with planning.

As a precedent, one could consider the Thames Tideway project, which we understand incurred planning costs of [£120m - £150m] relative to a total project spend of ~£4.2bn. By setting an initial limit of just £10m per year as automatically recoverable, the Draft Policy Statement puts an unreasonable level of risk on the airport operator. Even over a 5-year planning process, this implies that only £50m would be automatically recoverable.

In Heathrow's view the £10m figure appears arbitrary and, while it may have been accepted by GAL as a condition in their licence, if it is to be included in Heathrow's licence the onus will be on the CAA to produce a robust justification.

Further, it is unclear how the policy fulfils the CAA's stated objective of encouraging investment in airport expansion. We welcome the approach to apportion costs to those best able to control them, and therefore mitigate the risks associated with the variability of those costs. However, we feel that in its current form the CAA's policy will not fulfil the objective of encouraging investment as it would, in effect, require the airport operator to 'insure' the rest of the sector against a wide variety of risks that are beyond the operator's control.

3.2 The categorisation of costs

We understand that it may not always be appropriate for an airport operator's costs to be fully recoverable from users and that it is important to ensure that the operator faces appropriate incentives to minimise its costs. However, we do not feel that the CAA's proposed approach to

categorisation of costs will create the right balance of incentives in relation to efficiency and investment.

As noted by the CAA, there is a great deal of uncertainty in relation to airport expansion at present. Therefore, a blunt approach which categorically rules out, or sets arbitrary limits on, the recovery of certain costs creates a significant regulatory risk. As already explained, this may also undermine the prospects for successful commercial negotiations.

There are two practical issues with the general approach of cost categorisation. The first is that the categories have been defined in terms of the timing of the Government decision and planning approval. The CAA's proposals for regulating costs in the manner suggested appears to rest on an efficiency argument, in which case the category definitions ought to relate to the underlying activities. However, the category activities do not align with the decision timing, and therefore the efficiency properties of the proposal are significantly weakened.

Secondly, if the CAA defines the categories more precisely according to activities in order to restore the incentive properties, it will necessitate a complex cost allocation exercise, increasing the regulatory burden on the operator and the CAA.

Overall, we do not see a good reason to depart from the current approach to cost recovery of allowing the full recovery of efficiently incurred costs. We agree that this should be adopted in relation to category C costs, and also believe it should be used for categories A and B.

3.2.1 Category A costs

The Draft Policy Statement states that Category A costs are optional but not necessary.

Heathrow does not accept that analysis. It is unthinkable that any major airport could simply refuse to participate in the AC's review. The point of the AC is to set optimal outcomes for new capacity in the public interest. It makes little sense for the major airports to be incentivised to minimise their co-operation with the AC. Indeed, to the extent that there is overlap between the statutory objectives of the CAA and the work of the AC – which is likely to be very considerable – it is impossible to reconcile the CAA's intended approach to Category A costs with its open door policy and its statutory duties.

It is clear, in any event that some costs incurred before a government decision will be inherently related to a planning application and, acting in the interests of users, it would be both prudent and efficient to invest in this activity before a Government decision. Similarly, it would prejudice sensible debate and development of the optimum capacity solution for users if Heathrow were not to participate fully in the AC process. Moreover, the efficiently incurred costs of doing so (which will produce strategic thinking that is then used at later stages, e.g. applying for planning, securing finance, scoping and structuring the project and delivering the capacity in a well-managed fashion) ought to be recoverable as the work will result in savings later in the process.

Similarly, the CAA's arguments that Heathrow should not be allowed to recover any costs associated with purchasing intellectual property from HHL under Category A are counter-intuitive. The draft policy states that all Category A costs are non-recoverable as they are inefficient – it also states that Heathrow could not recover costs of HHL intellectual property because, had it been efficient, Heathrow would have proposed it as a solution. But if it is selected, then it will have been decided by the AC to be efficient and the preferable option for capacity expansion. If the HHL proposal is chosen, Heathrow will need to consider whether

assisting with the delivery of the HHL proposal makes commercial sense and, if so, all efficiently incurred costs associated with developing capacity in accordance with the AC's preference ought to be recoverable.

Relatedly, while regulatory policy should be consistent across the different propositions, we note that Heathrow is currently subject to regulation whereas HHL is not. Moreover, if HHL's proposition were to be recommended, it is not clear how this would work in practice, or whether it would be subject to regulation in the future. Therefore, at this stage there may be legitimate reasons for a different regulatory approach to cost-recovery, not least because HHL may benefit from potential commercial "upside", something that is not necessarily available to Heathrow as a regulated business.

Finally, if the CAA accepts – which it does – that it is in the interests of users that there should be increased capacity, it makes little sense to incentivise airports not to try to persuade the Government that they should allow such capacity to be developed. The airports have a direct incentive to do so and are likely to be best placed to do so. Category A work will therefore contribute to the outcome identified by the CAA.

In short, as explained above, we believe that all costs, including those relating to Category A activities, should be recoverable if efficiently incurred.

3.2.2 Category B costs

Heathrow agrees that costs of constructing new capacity are costs which users can be reasonably expected to carry. We also note the argument that not all costs should be borne by users in the event that planning permission is not granted, withdrawn or rescinded. We have four key observations regarding this risk:

- The proposed threshold of £10m per year is too low. This is likely to cover a small proportion of the costs associated with planning and may therefore present a commitment challenge from investors. Given the anticipated level of spend, this level of allowance provides no incentive to reduce Category B costs – as was intended by the policy.

- The CAA's draft policy is unclear as to whether costs over £10m are 'at risk', and to what level, in both the scenario where commercial agreements are reached and the scenario in which they are not and a regulatory regime is subsequently imposed.

- In the latter scenario, it is important that the incentives to proceed are re-balanced so as not to blunt the decision to invest and prejudice the financeability of the project

- The £10m figure appears arbitrary. It seems to have been proposed because it is a round number which was accepted by GAL as part of their licence. The CAA has not sought to justify it in the current context. If, as is proposed, the CAA intends to put it forward as a licence amendment for Heathrow, Heathrow expects the CAA to produce a robust justification.

Finally, while we do not believe that selecting an apparently arbitrary figure is the best way for the CAA to proceed. However, if there is to be a figure, it is imperative that a realistic level is set. The current structure does not encourage efficiency because the level is set too low. If the CAA set a realistic figure, airports would be in a position to take well informed decisions about

what costs to incur in relation to Category B costs and would operate under an appropriate efficiency incentive.

3.2.3 Category C costs

We broadly support the CAA's proposals in relation to Category C costs. As already noted, we believe that costs should be recoverable if efficiently incurred. However, in relation to a project of the scale of airport expansion, it is important to appreciate the difference that time may have on the understanding of what constitutes an efficiently incurred cost.

As has been acknowledged by the Airports Commission[5], and in many other large infrastructure expansion projects, there is a tendency for *ex ante* estimates to understate costs and the time required to complete the project. This is referred to as the 'optimism bias' or the 'planning fallacy'. As such, an *ex ante* estimate of efficiently incurred costs may be likely to understate the actual costs, and it will be important to take account of this.

The alternative of *ex post* estimation of efficiency suffers from the fact that it benefits from hindsight. This creates a risk of under-recovery of costs due to events that could not reasonably have been foreseen. That is, the decisions were 'efficient' based on the knowledge available at the time, and only appear to have been inefficient with the benefit of hindsight. This is a material risk given the degree of uncertainty surrounding airport expansion. As such, an *ex post* determination of cost efficiency would likely create adverse investment incentives.

We believe that an *ex ante* approach, taking account of optimism bias, will deliver greater regulatory certainty, and therefore better support investment in airport capacity. However, it is inevitable that the cost estimates will need to be revisited. We believe that to preserve the investment incentives, it is important that subsequent adjustments do not apply retrospectively. That is, costs already incurred which were deemed efficient at the time should not be revised downwards based on information that was not available to the relevant decision maker.

If, on the other hand, it turns out not to be possible to complete projects on the basis of original estimates due to optimism bias or circumstances beyond an airport's control, then it is appropriate for over-runs to be added to the RAB, provided always that the costs were efficiently incurred.

3.3 Front loading

Heathrow welcomes the CAA's approach in the Draft Policy Statement on front-loading / pre-financing. Heathrow agrees with the preliminary conclusion drawn by the CAA that front-loading is in the passenger interest.

As the CAA concludes, front-loading would reduce the overall cost of financing the project, which in turn would reduce price pressures on passengers. It would smooth airport charges over the development and implementation of the project and it would actively support the development of the project by providing the appropriate cash flows to support its cost-effective implementation.

In addition, front loading is clearly in users' and passengers' interests. For example:

[5] Airports Commission, Heathrow Airport North West Runway: Business Case and Sustainability Assessment, November 2014.

- **It promotes efficiency and economy:** The purpose of additional capacity is to help alleviate congestion, facilitate competition and further improve service quality in the face of expected passenger growth at Heathrow. Capacity additions will further promote the efficient and economic operation of Heathrow and it is in the interests of users to allow prices to adjust such that prices are relatively higher prior to the capacity coming on stream and relatively lower when it is completed.

- **It incentivises efficient investment:** Disallowing any form of "pre-financing" or imposing a tighter price cap would be more likely than not to cause Heathrow (and other airports) to slow and/or reduce investment programmes with likely adverse effect on both current and future users. It may also be inconsistent with the CAA"s statutory duties given the current and expected unsatisfied demand at Heathrow.

Heathrow agrees with the CAA in considering that front-loading is a feature of competitive markets. Heathrow agrees with the discussion that in a competitive market, price rises can be a signal for increasing output and investment. Relatedly, given the CAA discussion that Heathrow's regulated charge is below the market clearing price, Heathrow is keen to understand the CAA's views of how capacity constraints might affect pricing at Heathrow, across the value chain, and how any distortion of the market could be addressed by enabling front loading of airport development costs and/or permitting a departure from the current "cost plus approach". In order to help frame this work Heathrow has included further views on this specific aspect in Annex 2 [A paper by Europe Economics]

Pre-financing is also critical feature of the current regulatory framework and has worked extremely well at Heathrow. For example, in the context of financeability, pre-financing helps Heathrow maintains the necessary credit ratings. Indeed, a departure from pre-financing could potentially have a significant impact on Heathrow's credit risk rating, which would affect the overall cost of financing. Heathrow welcomes the fact that the CAA is not minded to alter that particular element of the current framework. Again, in order to help inform discussion on this issue Heathrow has commissioned independent work on pre-financing and this is set out in Annex 3 to this response [A paper by NERA].

3.4 Inter-generational 'transfers'

Heathrow notes the CAA's discussion on how the benefits of front-loading must outweigh the potential detriment of increased costs for current users (passengers). Heathrow considers that the CAA must not regard passengers simply as the current generation of passengers. Neither should it introduce an artificial distinction between differing generations of passengers. Rather, the CAA should consider the best interests of passengers more holistically as a continuum of current and future users. The CAA's duties are not limited to current passengers but apply to users generally.

In addition, the general duty in section 1 of the Civil Aviation Act has to be read in the context of subsection 1(3), which requires the CAA to take account of:

(a) the need to secure that each holder of a licence under this Chapter is able to finance its provision of airport operation services in the area for which the licence is granted, and

(b) the need to secure that all reasonable demands for airport operation services are met,

Both these factors tend towards allowing front-loading insofar as it is efficient in reducing costs overall.

So, Heathrow agrees that any consideration of inter-generational transfers should be based in the CAA's statutory duties (coupled with a consideration of economic and regulatory precedent). Contrary to the CAA's assessment, however, Heathrow is not persuaded that there is a material conflict between different classes or generations of users.

The CAA's primary duty provides the necessary guidance and discretion for regulatory policy. The statutory duty is effectively forward-looking: *furthering the interests of passengers in respect of the range, availability cost and quality of services*, cannot be given effect instantaneously, neither is it discrete. It is a continuous process and develops over time through on-going capital investment and other means. Therefore, it is not necessarily a matter of measuring the costs and benefits between different generations, but identifying the policy which best meets the statutory duty.

In that respect, the CAA's discussion around passengers carrying demand risk is not necessarily a valid consideration in the context of front loading, as passengers will carry an appropriate proportion of demand risk irrespective of whether the CAA proposes any kind of front-loading. Therefore, Heathrow considers that the key test that the CAA should look at is the overall cost of the project and how that cost changes when front-loading is and is not permitted.

3.5 Sculpting depreciation

We note the CAA's proposals on sculpting depreciation, to be embedded in the existing RAB-based approach. Depreciation is an integral part of the total revenue requirement allowance; it broadly amounted to 30% the Q6 price control review, so any policy change around depreciation should considered very carefully.

This policy proposal appears to be intended to relate the level of airport charges to levels of infrastructure utilisation and to avoid a significant step change in terms of airport charges per passenger.

The CAA's proposal raises some interesting issues, and further consideration is clearly required. Heathrow's initial thoughts on sculpting are set out below.

3.5.1 Sculpting

Sculpting (economic) depreciation relates asset consumption, in the form of depreciation charges, to utilisation levels. Under such a construct passengers would in theory pay for their individual share of consumption. In this context, it is important to note that Heathrow's capital investment plan has been designed in such a way that capacity matches forecasted demand. Therefore, this approach capacity expansion implicitly provides for an "adjusting" factor to airport charges (and depreciation), phasing charges according to passenger demand (utilisation).

3.5.2 Regulatory and business certainty

The current regulatory policy around depreciation is well established and understood by every industry stakeholder. Under the current policy on regulatory depreciation, the RAB value

appropriately reflects the overall value of Heathrow airport as it is calculated based on the real asset life. A departure from current policy would generate a mismatch between the value of the airport, as measured by asset life, and a notional RAB value based on economic depreciation.

3.5.3 Added complexity

Relating regulatory policy to forecast passenger numbers would inevitably add complexity to the regulatory regime, particularly to the already complex airport charges calculation and to the RAB roll forward exercise at the end of each price control period.

3.5.4 Increased demand risk

Under the current regulatory framework, Heathrow is already exposed to considerable risk. As the CAA identifies, a new approach to depreciation and the RAB would increase airport risk and therefore the cost of capital. It is intuitive that, by relating depreciation to forecast passenger numbers, the CAA would be generating traffic risk at two levels; the overall revenue requirement level and at the level of the depreciation charge. In other words, the CAA would be increasing and concentrating risk. Any rationale investor would demand a greater return on investment compared to previous the state

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Section 4: Other policy related issues

4.1 Recovery of all efficiently incurred costs

The CAA's draft proposals refer to the recovery of certain Category A and B costs. Heathrow agrees that the proposed phasing of cost recovery is important, but subject to an appropriate balance of incentives, all efficiently incurred costs should ultimately be recoverable in a timely and proportionate manner. Similarly, maintaining an appropriate balance of incentives also means that the regulated entity has the incentive and scope to retain the benefits of any out-performance.

The proposed phasing of cost recovery is critical from a number of perspectives, not least, investment incentives and the overall business case. While Heathrow acknowledges the presence of uncertainty, it is clear that (efficient) costs are currently being incurred in support of the AC's review and preparatory planning related activities. Moreover, a significant amount of cost will be incurred well in advance of many of the key milestones in the process, notably hardship oriented costs and what are likely to be substantial planning related costs.

For the purposes of the CAA's forthcoming policy statement, Heathrow believes that the CAA should consider the regulatory treatment of these more immediate costs, those incurred during the Q6 period. These costs should be recoverable in Q6 by means of adjustment to the current price control (given effect by a licence modification or similar).

It is important to note that these are efficient costs which will inevitably be incurred at some point in the expansion scheme and are not realistically avoidable now. A good example of this is hardship costs. Home owners who experience blight now – for example because they need to move house now, through pressing professional, personal (E.g. divorce) or medial reasons – have a realistic expectation that they will receive compensation now. To distinguish between that case and a similar case that occurs later in the process is entirely arbitrary[6].

While we acknowledge the CAA's comments that commercial agreements could make provision for these types of cost, it must be recognised that any such agreement is unlikely to be concluded until after many of these costs have been incurred, and any such agreement concluded in the future would be unlikely to contain conditions enabling the retrospective recovery of certain historic costs. Moreover, in order that there is policy consistency and regulatory equity as between Heathrow and GAL, we would welcome the CAA's proposals for a licence modification to give effect to its proposals on the recovery of these costs.

Heathrow's view is that Condition C1 should be amended to specify the following:

> *"The RAB shall be adjusted upwards in any Regulatory Year by the amount of any costs incurred by Heathrow in preparing for a new runway, provided they are efficiently incurred."*

4.2 Slot Regulations

The Draft Policy Statement refers to preferential treatment on slot allocation in return for pre-financing of increased capacity being an obvious commercial avenue to explore but rightly

[6] Heathrow's response to the CAA's earlier Discussion Paper set out an initial view of the types and likely scale of costs, this included hardship related costs, general property compensation costs (including commercially related property) and other costs.

points to the impact that the Slot Regulations will have on commercial negotiation with airlines in that area.

Heathrow, in common with the CAA, would be keen to see if there is any scope for commercial mechanisms that establish linkages between financing of the new capacity and the subsequent benefits of new slots and/or associated returns. Obviously if the rigours of the slot allocation regime make commercial negotiation more complex, this will need to be reflected in Heathrow's ability to recover the costs of expansion by other, less commercially obvious means and it would look to the CAA to recognise the potential for this EU mandated regulatory obstacle to its commercial freedom to conclude a negotiated agreement.

The overarching goal here must be to establish the most efficient mechanisms for cost recovery, in the interests of users. To the extent that this goal is complicated by the Slot Regulations, Heathrow would welcome further engagement and commitment from the CAA in overcoming these potential barriers.

Notwithstanding the above, Heathrow shares the CAA's desire to see if there is scope for commercial mechanisms that establish linkages between financing of the new capacity and the subsequent benefits of new slots and/or associated returns, possibly in the form of payment by those who secure new slots to those who contributed. Heathrow has included some further thoughts on the impact of the Slot Regulations and how they might be minimised in Annex 1 to this response.

4.3 Risk/WACC

Heathrow has no further comments at this stage and we refer the CAA to Annex 1 of our response to the CAA's discussion paper. For ease of reference, this is attached as Annex 4 to this response.

4.4 Duration of regulatory period (price controls)

The CAA's draft policy on the duration of any future price control is not prescriptive at this stage, Heathrow supports this conclusion. A more detailed assessment should be carried out in the future with the most up to date information.

Notwithstanding, the current Statute and Licence allow for a more flexible (and yet targeted) approach to economic regulation. To the extent that an extended price control period were considered proportionate and appropriate, in the circumstances, then the current regulatory/licensing framework would provide a legal basis for longer price control periods.

Heathrow considers that it will be economic and operational factors that will determine whether the price control period should be extended or otherwise. For example, the investment horizons, and the very significant nature of existing and forecast investments at Heathrow, indicate a longer price control period than the current five years would be preferable.

Heathrow acknowledges the CAA's analysis and broadly agrees with it; in particular Heathrow welcomes the proposed flexibility in that not all variables of a price control have to be determined for the same duration, for example some of them could be locked in for longer. Heathrow considers it may be possible to provide more certainty than just by means of policy documents (or comfort letters). For example, a separate licence condition could be set for the

locked in elements of the control, with only the shorter term elements to be adjusted periodically. We would welcome the opportunity to discuss this further in due course.

4.5 Market Power Assessment

Given the Draft Policy Statement, Heathrow assumes that the CAA is relying on the existing Market Power Assessment when considering if intervention is necessary and appropriate now or if intervention may be necessary at a future date. Clearly, if the threshold for regulation is not met, the CAA's mandate for intervention is less clear.

Obviously, the introduction of new capacity (both in prospective and actual terms) will have an impact on the market and any assessment of dominance within it. It is difficult to prejudge the impact of any recommendation by the AC as to new capacity or any Government decision about how such a recommendation may be implemented. It may well be that either or both of these give rise to a material change of circumstances that requires a further analysis of the market to consider whether regulation is appropriate.

Heathrow cannot predict the outcome but would urge the CAA not to prejudge the situation and fetter its discretion to act in accordance with the statutory regime in due course if necessary. Maintaining the flexibility to use the existing rules to make sound decisions on the appropriate level and scope of regulation at suitable junctures is key.

Section 5: Timelines and outline plan

As Heathrow progresses with work on capacity expansion, we will continue to engage with the public, the airline community and all other stakeholders. Indeed, engagement with all stakeholders will be integral to the process and is something that Heathrow will undertake as a matter of course, it is standard business practice.

In terms of the CAA's proposals on commercial negotiation, Heathrow recognises there is a role for some form of commercial settlement in the capacity expansion process. It is important however that any engagement and negotiation is genuinely constructive, timely, efficient and "adds value" to the overall process to the extent that it produces mutually beneficial outcomes (in the passenger' interests). Where that negotiation is affected by regulatory constraints, these must be recognised (and minimised where possible).

5.1 Commercial engagement

As work is taken forward on capacity expansion there will be scope for commercial agreement on some or all aspects, through bilateral non-discriminatory agreements or multilaterally, which may be given effect though the Conditions of Use (or similar). As noted in Heathrow's previous response, Heathrow should be given the opportunity and time to explore the scope for potential commercial agreements without risk of these being undermined, or being 'crowded out' by the regulatory process.

We note the CAA's view that it would be minded to review progress on commercial engagement after a period of 6 months from any Government decision. This is broadly consistent with Heathrow's view (indicative Government support may be forthcoming before a formal National Policy Statement (NPS). Following an AC recommendation, we anticipate a more considered and intensive period of bilateral and multilateral engagement with the airline community, and assume this would take a minimum of 9 months (up to ~12 months).

5.2 Would commercial engagement replace or replicate a CAA review?

Further to Heathrow's comments in Section 3 of this response, it will be important for Heathrow and all stakeholders to understand the CAA's role and the potential for regulatory intervention and whether a process of commercial engagement would replace, or effectively replicate a CAA review. In any event the CAA is required to judge Heathrow's proposals against its statutory duties, whether "agreed" through a commercial process or not, and it may, of course, be more expedient and efficient to adopt a process within some form of CAA "framework".

To that end, Heathrow and the airline community might consider commercial engagement within the broad framework established by the CAA's forthcoming policy statement,[7] as being preferable to regulatory intervention at all subject of course to the AC's recommendation and the content and timing of the Government's policy decision. If this were a potential model for engagement, it is important to ensure that:

- The CAA's preferences are fully understood by all stakeholders and there is a clear understanding of the point at which regulatory intervention would be considered appropriate and the mechanism by which such intervention would be triggered. Any alteration of the regulatory policy mid-way through a commercial negotiation has the

[7] This will also help address any perceived asymmetry in bargaining strength or similar issues.

potential for distortion and would not be in line with the regulatory principles set out in the Act.

- The chances of regulatory involvement having an adverse impact on suitably negotiated commercial agreements after the event. The risk of any retrospective interference with commercially negotiated arrangements should be minimised to ensure the best chance of a market-led solution.
- The commercial negotiations should be allowed to run their course and all stakeholders should be allowed to participate in those negotiations to the best of their ability. It can detract from administrative efficiency and optimum participation if resources are diverted to a regulatory debate prematurely. Duplication of effort caused by multiple simultaneous work-streams considering the same issue from a different perspective will increase the costs for all and the inevitable overall delay that will ensue is likely to prejudice user interest. To be clear, Heathrow does not believe that a process of "constructive engagement" as employed in previous price reviews would be beneficial.

5.3 Timescales and administration

In our response to the CAA's discussion paper we stated that one of the key considerations is timing, timescales and the potential administrative burden (on all stakeholders). This remains the case. At this stage of the process it is too early to be definitive on all timescales and milestones. However, a number of milestones are relatively clear, for example, the timing for the AC's recommendation, as are Heathrow's expectations for the duration of certain processes, whether public or commercial. Therefore, a very high-level plan can be constructed establishing an outline process with key programmes and milestones. This high-level plan is shown in the table below.

Table 1: Draft Timeline

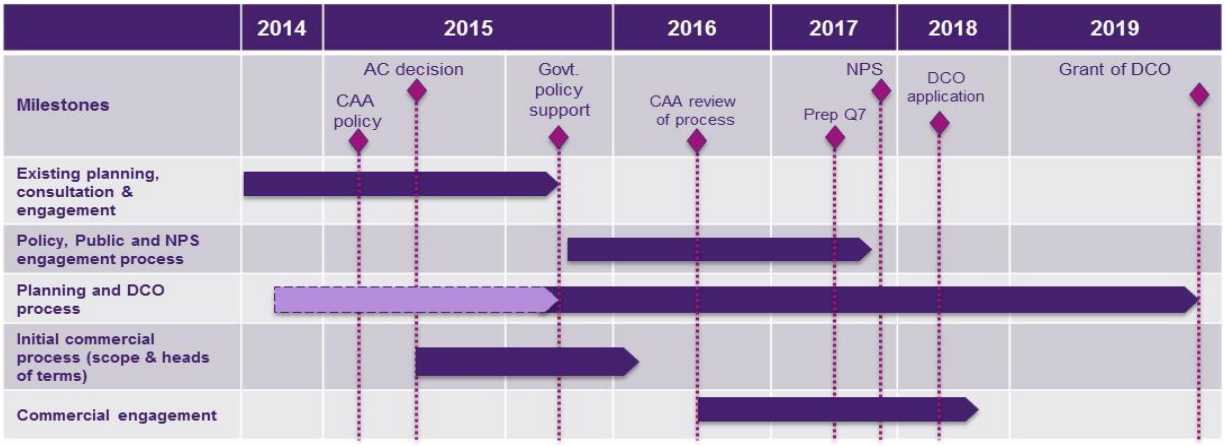

Table 1 represents a highly simplified view. It is a draft, provided for the purposes of understanding the likely timescales associated with the various processes and potential programme milestones.

- Firstly, it is evident that Heathrow will continue to be required to simultaneously engage in a number of complex programmes of work. In order that Heathrow is in a position to efficiently process work and effectively realise the benefits of expansion, it is critical that the CAA avoid duplicating the work of the Government and/or the planning authorities. It

is also imperative that the CAA help to provide industry with the proper basis and scope to engage.

- While engagement is already underway with all stakeholders, including airlines, it is only after the AC's recommendation that commercial and other engagement can be progressed in earnest. At that stage, industry will have both the CAA's Policy Statement and the AC's recommendation; we assume outline Government policy support would be forthcoming very shortly after the AC's recommendation. Pre-NPS completion and formal planning application, work can be then taken forward on the scope for any commercial agreement and relatedly, the 'heads of terms'. We assume this could take something like 9-12 months (to mid-2016).

- Given that the formal planning process could be around 4 years, and that the NPS process is indeterminate, it is extremely difficult to plan for the actual development and completion of commercial settlements. However, the initial period of commercial engagement would provide a basis for both any future engagement and, after completion, a suitable point for the CAA's proposed 'interim review' (see page 22, paragraph 3.24 of the CAA's draft policy).

- Heathrow will be developing its DCO application at a later time, this might be the right time for the CAA to consider its review of the overall scheme design and costs (subject to that review not prejudicing Heathrow's planning application, commercial settlements or otherwise). Given the CAA's involvement in the overall process to date, and its likely involvement in any Government NPS process, Heathrow assumes that any future CAA review would neither be extensive nor too time consuming; we assume any CAA review would take no more than 3 months to complete.

Finally, we assume that from the beginning of 2017 there will be relative clarity as to the CAA's policy, the Government's NPS and Heathrow's progress toward a DCO. Therefore, it might reasonably be assumed that further commercial engagement can be taken forward from that point. However, in the event that commercial settlements are unlikely, there would still be sufficient time to consult on and develop the regulatory framework.

Section 6: Conclusion

Heathrow is broadly supportive of the CAA's stated approach to principle-based regulation founded on an appropriate allocation of the risks (or costs) of capacity expansion; a preference for commercial negotiation; and an acceptance that a measure of pre-funding may be in users' interests.

There are aspects of the more detailed explanation of the policy details underpinning those broad principles with which Heathrow does not agree. In particular, it strongly believes:

- All efficiently incurred costs should be recoverable via existing regulatory means;
- The regulatory framework should not preclude or prejudice effective commercial negotiation but should facilitate the optimum outcome for capacity expansion as being in the users' best interest;
- With this in mind, the CAA should not be taking a stance on what categories of costs may or may not be recoverable at this stage or capping the amount of such costs to an arbitrary level;
- Since the Slot Regulations may impact on Heathrow's commercial freedom to negotiate slot preferences in return for prepayment, the CAA should work with industry to explore what scope exists within the current regime;
- As well as maintaining an appropriately flexible approach to regulation, the CAA should not prejudge the timing at which a market power assessment might be appropriate given the possibility of a material change in circumstances to arise at any point.

Annex 1: Slot Regulations

Slots and their allocation are a material issue, whether in a commercial agreement or as part of a regulatory outcome. Whilst Heathrow recognises that it is difficult for the CAA to change the regulations at a policy level, we would encourage the CAA to support all stakeholders by being more explicit about its views on the scope for commercial solutions. This could be through collaborative thinking with industry on the potential for changes to how the regulatory framework is currently implemented in the UK. For instance, whether, after the introduction of new capacity, an airport would still classified as 'congested' and therefore subject to full coordination; how local guidelines might be used to increase the opportunity for an airport operator to be involved in the allocation of slots, or for pre-payment to be taken into account by the coordinator when slots are allocated; or how commercial agreements could encourage specific types of usage of slots – all whilst following the principles of neutrality, transparency and non-discrimination.

The CAA further notes that the Slot Regulations mean that, at a coordinated airport that expands capacity, an incumbent airline may not be able to capture any of the expected benefits from up to half of the new capacity while its non-incumbent actual and/or potential airline competitors may stand an increased chance of securing new slots. [✂].

Heathrow has set out below its thinking on possible interpretations of the Slot Regulations that would enable incumbent airlines to apply for slots in the new capacity.

Examples of how incumbent airlines might be able to apply for slots

Broadly speaking, the Slot Regulations require capacity in the slot pool at a co-ordinated airport to be allocated so that 50% of the slots are first allocated to new entrants unless requests by new entrants are less than 50%. The definition of "new entrant" is therefore key. It is found in Article 2b of Regulation 95/93 (and the UK implementing regulations refer out to that definition).

There is an overall cap so that an air carrier cannot hold more than 5% of the total slots available on the day in question at a particular airport (less if it is an airport system). Otherwise, to fall within the definition of new entrant, there are three limbs that can be considered (a more general limit, a limit on any EC route and a limit on a regional route. There are also limits that apply to group companies.

It is therefore not certain that, if all new slots were opened at once, new entrants would be able to take up 50% of slots (it would require 10 new entrants to take up 5% each). This could lead to incumbents getting access to that capacity by default.

[✂]

Furthermore, whilst Heathrow notes the requirements for local guidelines to comply with Community law, there may be a degree of discretion in the allocation process that could be used to minimise the adverse impact of the Slot Regulations. Discussions with ACL would suggest the following order of priority:

- New entrants
- Year round operations, in particular where airline already operates in one season

- Introduction of new routes
- Less competitive routes (e.g. route with single airline prioritised over route with 2+)
- Maximisation of capacity – prioritise larger aircraft
- Curfews and restrictions at the other end
- Take the above into consideration and try to be fair and practical

The airport can submit local guidelines for the allocation of slots. The introduction of a Heathrow Local Rule which requires the coordinator to prioritise the allocation of new capacity to routes which support the UK hub, greener aircraft or new routes would be theoretically possible. However, the support of the Coordination Committee would be required in order to properly implement such a rule. Recent Committee decisions have not favoured local rules that restrict airline use of slots.[3]

Another avenue to consider is whether Heathrow could be reduced to a "schedules facilitated airport" on the introduction of the new capacity. There is a legal requirement for the 'coordination' of 'congested' airports. However, should slot capacity increase by, say, 50% then it could be argued (maybe after two seasons) that Heathrow is no longer congested.

[3] Note that BA has 55% of the vote of the Coordination Committee and so effectively have power to pass or veto any proposed Local Rule.

Annex 2: Paper by Europe Economics

Europe Economics

Three Conceptual Issues Concerning Airport Capacity and Price Capping

Europe Economics

December 2014

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Contents

1 Three Conceptual Issues Concerning Airport Capacity and Price Capping

1.1 Introduction

This document was commissioned by Heathrow. Heathrow asked Europe Economics to consider three issues, in the context of the CAA document *Economic regulation of new runway capacity — a draft policy*[1] (hereafter referred to as "the CAA document"):

- how the economic concept of market-clearing prices is related to competitive pricing and monopoly pricing;
- what the real option called the "option to wait" implies for the path of equilibrium prices in a competitive market and how this might be related to certain versions of "pre-funding" of airport capacity;
- whether, in a supply chain characterised by significant market power at more than one step in the chain, a cap on prices within the supply chain, necessarily implies lower prices for final retail-level consumers.

1.2 Market-Clearing Prices, Competitive Prices and Monopoly Prices

A market-clearing price is a price at which demand equals supply. It is thus a concept of equilibrium. Absent constraints upon pricing freedom (e.g. price caps imposed upon regulated utilities or price floors such as those imposed under the Common Agricultural Policy), markets can be expected to clear under any competitive conditions.

This is a point of particular interest because there appears to be some conceptual confusion in policy-making, partly reflected in the CAA document. For example, at paragraph 3.36ff the CAA document states (our emphasis):

> *"We also noted that, given excess demand and capacity constraints within the London area, it is likely that the current regulated price at HAL is **below the market clearing price**. In the absence of regulation, given the current capacity constraints and that HAL is the only operator in the relevant market, the **market clearing price would most likely be far above competitive levels** (potentially at levels close to the price that would be set by a dominant operator).*
>
> *"If expansion becomes unblocked, we consider that it may be appropriate to allow airport prices to rise to levels higher than the current 'cost-plus' approach. However, this will only apply **where the market clearing price is higher than the regulated price**."*

In a competitive market, prices and quantities adjust until the market clears — i.e. until supply equals demand. In a monopoly setting, prices and quantities normally likewise adjust until the market clears — until supply equals demand. The difference between the two situations is not whether markets clear. It is

[1] http://www.caa.co.uk/docs/2888/CAP1221.pdf

that in the monopoly setting the market clears at a higher price and a lower quantity.[2] Again, the presence of a capacity constraint does not imply markets do not clear. Where there is pricing freedom, in a capacity constrained environment (be it in a competitive market or monopoly) prices will be higher than where capacity is not constrained. As pressure arises for demand to outstrip supply the market clearing price will rise, rationing demand such that markets clear.

If a market does not clear (for example because of a price cap) there must by definition be either excess demand or excess supply which is not being rationed by price. For example, if demand is in excess it may, instead, be rationed by queuing, as used to occur in Communist countries in which prices for certain goods were set artificially low but quantities produced were inadequate to service the demand at those prices.

Thus a price cap that is credible (i.e. expected to be maintained over a period ahead) and set at the competitive/contestable equilibrium price will not prevent markets from clearing. The regulated entity will find it profitable to sell the competitive/contestable equilibrium quantity at the competitive/contestable equilibrium price. In this way regulation produces an outcome that mimics the competitive/contestable outcome. If markets do not clear at a regulated price cap, that suggests that the price cap has been set so artificially low that the supplier is unable, profitably, to service the demand at that price.

1.3 Capacity Constraints, the Option to Wait and Prices in Competitive Markets

At paragraph 3.30ff the CAA document describes one sort of situation in which prices respond to capacity constraints:

> *"In a simple supply and demand model of a competitive market, if capacity were insufficient to meet demand, prices would rise until demand had been priced off such that available supply or capacity could serve that demand. If a market participant had the ability to expand, creating new capacity with a lower unit cost than current 'scarcity prices', then it would have an incentive to build this capacity, so long as the perceived value of future gains exceeded the perceived costs. The effect of this expansion of supply would be to enable more demand to be served, reducing prices to a new market-clearing point. The extent to which prices fall depends on the gradient of the demand curve.*
>
> *"In practice, in many markets this process happens in small increments, such that investment is made along with demand growth and prices do not rise, and/or participants plan and invest ahead of demand growth.*
>
> *"If expansion was likely to arrive in a large 'lump', however, prices might rise significantly before a new investment was made. Where the cost of the new 'lump' was relatively low, and it led to a large price effect – large enough to swamp any price effects that might arise from smaller expansion projects – then the latter might not be built. However, where the price resulting from the expansion is expected to be quite high, smaller expansion projects may well be viable."*

While the CAA's discussion here is broadly correct, it is incomplete as a description of the relevant theory of competitive price paths. In particular, it does not recognise the implications of the "option to wait". How price regulation should take account of the impact of the option to wait, in the presence of lumpy investment decisions, was analysed in some detail in Section 9 of Ofcom's 2005 document *Ofcom's approach*

[2] There are also more complex situations in which monopolists are able to price discriminate so as to produce non-uniform pricing when competitive prices would be uniform or be more uniform (price differentiation can be a feature of competitive prices, also). In such a setting some monopoly prices might be lower than some competitive prices. But even in that case the market still clears.

to risk in the assessment of the cost of capital.[3] There it was noted that the real option termed the "option to wait" may exist when:

1. there is an option to wait and see – i.e. investments are not now-or-never;
2. net returns are uncertain; and
3. investments are irreversible.

The option to wait may, in some markets, be countervailed by other real options such the option to pilot or stage investment. In the case of an additional airport runway, it is fairly clear that conditions (1) to (3) will apply and there is limited scope for staging.

Where there is an option to wait, in competitive or contestable markets a rise in price above the long-term equilibrium price may not stimulate immediate entry or investment even when entry is costless and there are no liquidity constraints upon financing. Intuitively, the reason is that the additional demand that is bidding the price up and that may be serviced by extra capacity may not be there indefinitely. If investment is irreversible and there is a risk that extra demand may peter out, and if there is the option to wait until later to see whether the demand does in fact persist, investment will not be triggered immediately upon prices rising above the long-term equilibrium level.

In this context, there are a number of relevant points. .

- First, we emphasize that price rises, that do not immediately trigger new investment or entry, can occur in competitive markets. They are not *per se* a consequence of monopoly power.

- Second, in competitive markets, even in the presence of the option to wait, investment will still occur whenever the expected net present value of such investment is positive where that net present value embodies expectations about periods of pricing above the long-term equilibrium level.

- Thus, thirdly, periods of above-long-term-equilibrium prices do not imply excess aggregate investment returns in a competitive setting. They affect the profile of prices, not the aggregate level of returns over the lifetime of an investment — i.e. part of the expected return from an investment arises from the possibility that returns on that investment are higher than average for a period just before the next investment is triggered.

- Fourthly, that the option to wait can mean capacity constraints that persist even when the price in a competitive market rises above the long-term competitive price does not imply that markets do not clear in that case — for the reasons set out above.

It is of interest to relate this to the debate about the "pre-funding" of airport capacity. One version of the "pre-funding" concept is that airports should be allowed to charge prices that are above the long-term equilibrium price for a period in advance of initiating new investment and then, perhaps, also early in the period of new investment. Sometimes this is characterised as the higher prices providing the funds for the investment (hence the term "pre-funding"). But the real options analysis illustrates that another way to regard prices that rise in advance of new capacity investment and then stay high early in the period after such new investment, potentially falling back a little subsequently, is that this is not some more-or-less artificial financing device that arises only as a consequence of regulation. Rather, where there is an option to wait and investment is significantly lumpy, such a time profile of prices reflects the natural competitive price path that regulation should be seeking to mimic.

1.4 How Price Caps Affect Retail Prices when there is Significant Market Power at more than one Point in a Supply Chain

In regulatory theory, price-cap regulation should exist where there is significant market power. Where there is such significant market power, then by definition the pricing decisions of the firm with that power

[3] http://stakeholders.ofcom.org.uk/binaries/consultations/cost_capital2/statement/final.pdf

are not fully or adequately constrained by the threat of competitive or contestable response by other firms. The objective of price cap regulation is to create those constraints upon pricing freedom, the absence of which is the reason the price cap regulation exists.

However, even if significant market power assessments are correct and price-caps set perfectly, that is not adequate to guarantee that either economic efficiency or the interests of consumers will be enhanced by price caps. In particular, if some market or regulatory failure creates rents and bargaining power at more than one point in a supply chain, constraining the pricing freedom of firms at one level of the supply chain without also constraining the pricing freedom of firms at other levels might simply re-assign bargaining power within the supply chain, sharing out the same aggregate rents, across the supply chain, differently but without any reduction in prices or rise in quality for final consumers. For example, the consequence of imposing a price cap on an upstream supplier without constraining downstream firms might be simply that larger profits are made by downstream suppliers, but with the prices final consumers pay being unchanged.

In the context of investment in airport capacity, we note that the CAA document suggests that the current constrained capacity at Heathrow creates a form of vested power for airlines that have obtained slots, relative to the more competitive slots market that might exist with greater capacity. At paragraph 3.19 the CAA document states:

> *"Indeed, the Slot Regulation facilitates new entrants obtaining capacity, and might therefore discourage the incumbent airlines from supporting expansion at all. The Slot Regulation also creates grandfather rights on slots, and airlines with a legacy position at a particular airport may not face the full cost of congestion."*

The implication of all of the above is that it cannot simply be assumed that capping prices for an upstream product will result in price reductions downstream, especially in an environment in which downstream suppliers have a vested position. Given that the CAA appears to concede that current prices (airport charges) are below market-clearing levels and given that the consumer benefit from below-market-clearing prices at one point in a supply chain is not straightforward, there could be a case for the CAA to set out a more explicit theory of how final consumers gain from the price caps currently imposed upon Heathrow when capacity is acknowledged to be constrained.

Annex 3: Paper by NERA on pre-financing

NERA
ECONOMIC CONSULTING

Infrastructure Pricing and Advancement of Revenues in Regulated Markets: Theory and Regulatory Precedent

Heathrow Airport Limited

11 December 2014

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Contents

1. Introduction and Summary

Heathrow Airport Limited (henceforth "HAL") has asked NERA Economic Consulting ("NERA") to look into the theory and regulatory practice for financing infrastructure investments with a particular focus on whether "pre-funding" (i.e. allowing regulated companies to raise funding for future investment from existing users) can be an efficient instrument for such investments.

The issue of "pre-funding" is particularly relevant in the context of current discussion around regulatory design for new runway investment in the UK. In order to remedy congestion at Heathrow Airport, HAL has set out a preliminary plan for the construction of a new runway at Heathrow Airport that would expand Heathrow's flight capacity from 480,000 to 740,000 thereby allowing current and forecast unmet demand to be served.[1][2]. The overall cost of the scheme is expected to be exceeding HAL's current regulatory asset base[3] with construction mainly taking place between 2019 and 2025.[4] Given the absolute and relative size of the investment, the framework for financing will be key in ensuring the investment is realised at the most efficient cost to final consumers.

In a regulatory context, infrastructure investments can be pre-funded through the advancement of revenues from later control periods.[5] While there is no single definition of what "pre-funding" entails the CAA (Civil Aviation Authority) has previously allowed for pre-funding of Heathrow Terminal 5 construction by

- Allowing BAA to include a cumulative price profiling adjustment (revenue advancement) of GBP 436.367 million in 2000/2001 prices over Q4 in order to improve financeability and to smooth the price path;[6] thus allowing BAA to increase charges before completion of the Terminal with the exact path linked to construction progress at a number of pre-defined project milestones (capex triggers); and in addition
- Allowing BAA to earn a higher rate of return on the whole asset base than would have been implied by comparator estimates not undergoing a similar investment programme.

The CAA has indicated that it remains open to using a pre-funding approach given that scarcity prices are consistent with competitive market outcomes. [7]

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1 Heathrow Airport Limited (2014): Taking Britain further – Heathrow's plan for connecting the UK to growth, page 32

2 Civil Aviation Authority CAP1195 (2014): Discussion paper on the regulatory treatment of issues associated with airport capacity expansion; page 10

3 HAL expects overall costs of £15.6bn compared to a current RAB of just under £14bn for the Q6 period.

4 The Airports Commission is currently expected to produce a final report and recommendations to Government in summer 2015. HAL expects that if Government takes a clear policy decision after the Commission reports then planning consent can be delivered by 2019, with the first flights using a third runway in 2025.

5 House of Commons transport committee (May, 2013): A10 Pre-funding of aviation infrastructure via charges

6 See CAA (Feb 2003): Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003 – 2008, CAA Decision, Paragraphs 4.11 through 4.28.

7 Civil Aviation Authority CAP 1221 (Oct 2014): Economic regulation of new runway capacity – a draft policy, page 22

> *In a simple supply and demand model of a competitive market, if capacity were insufficient to meet demand, **prices would rise until demand had been priced off such that available supply or capacity could serve that demand**. That is to say, the "scarcity price" can be a signal for increasing output/investment. If a market participant had the ability to expand, creating new capacity with a lower unit cost than current 'scarcity prices', then it would have an incentive to build this capacity, so long as the perceived value of future gains exceeded the perceived costs. The effect of this expansion of supply would be to enable more demand to be served, reducing prices to a new market -clearing point. The extent to which prices fall depends on the gradient of the demand curve.*

This report therefore first investigates the theoretical underpinnings of pre-funding and scarcity pricing in competitive markets before assessing the arguments and regulatory precedent for whether pre-funding remains appropriate for regulated infrastructure assets.

Pre-Funding – the Theory

In competitive markets, the short-run market-clearing price reflects the *short-run marginal costs* (SRMC) of meeting the last incremental unit of demand. Where investments are lumpy and / or have long lead times the SRMC of satisfying additional demand are likely to be significantly above *the long-run marginal cost* (LRMC) of meeting demand when supply capacity has adapted. These "scarcity rents" from charging current customers at SRMC will signal to potential competitors that the market in question is worth entering as prices are above their costs of production. In the long run, i.e. when capacity expansions are allowed to adjust to meet the long-run level of demand, the price reflects *the long-run marginal cost* (LRMC) of meeting demand when all outputs vary, but this only happens by allowing prices to rise above marginal costs to incentivize entry.

We therefore agree with the CAA that in competitive markets, it is efficient for prices to rise before new capacity is opened, and in many markets this process happens in small increments as capacity constraints tighten. Overall this competitive process is consistent with the policy of pre-funding for a new runway at Heathrow Airport in advance of operation.

There are two additional reasons, however, why pre-funding for a new airport expansion at Heathrow makes sense. First, there is evidence that passengers do pay scarcity rents at capacity constrained airports in general[8] and at Heathrow in particular, which are appropriated by the airlines.[9] Hence, in the absence of pre-funding, the prices that final users would pay at Heathrow airport would still likely reflect the scarcity prices but in this case, these scarcity rents would be appropriated by the airlines. The effect of pre-funding is therefore to reallocate these rents to the airport which reduces the overall charge to consumers in the long run.

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[8] Beckers et al (2010): Entgeltregulierung der deutschen Flughäfen Reformbedarf aus ökonomischer und juristischer Sicht (in German), p. 95; in a paper actually supported by the German airlines association (BDF). https://www.wip.tu-berlin.de/fileadmin/fg280/forschung/publikationen/2010/studie_entgeltregulierung_der_deutschen_flughaefen-v3.00_01.03.2010.pdf

[9] Frontier Economics (2014): Impact of airport expansion options on competition and choice

In other words: increasing airport charges when there is excess demand that cannot be serviced with the available capacity will increase cash flow to the airport operator without reducing final user demand. Such a pricing structure ensures that the scarcity rent, which is going to be extracted from final users in any case where capacity is constrained, is re-invested into airport infrastructure rather than being appropriated by the airlines.[10] This advance funding of new infrastructure leads to relatively lower charges when there is spare capacity after completion of the investment, which will benefit final customers.

Second, there is evidence that advancing revenues ("pre-funding") is likely to reduce the riskiness and hence the overall financing costs of the asset independent of its impact on utilisation, as a result of the following factors:

- It reduces demand risk by recouping a larger amount of total required revenues when demand is inelastic (in times of a capacity constraint) and less when demand is more elastic (after completion of the new capacity);
- It increases the size of the revenue allowance compared to capex cash outflow, which reduces the volatility of free cash flow in response to cost shocks; and
- It improves financial ratios by allowing companies to recover a larger portion of financing cost earlier thereby improving debt/ assets, interest cover and debt service coverage ratios, which are indicators of the likelihood of failure.

The above elements are all captured in rating agency Moody's assessment of company risk for airports.

Summary of Precedents

This paper also reviews other regulatory treatments of large capital infrastructure investments, and specifically the allowances provided by these regulators for allowing regulated companies to recover part of the cost of future / on-going investments from current users before the assets become operational. We summarise the results in Table 1 below which shows that almost all regulated sectors now employ a form of pre-funding for significant new infrastructure.

[10] Given that the CAA will only allow HAL to recover its costs, increasing charges in one "market" will reduce charges in the other while airlines are free to use the gains from scarcity rents in whatever way they want.

Table 1
Precedent for Pre-Funding

Airports	
UK Airports	Pre-funding through capex triggers and an increased WACC allowance for T5.
Dublin Airport	Full pre-funding (return and depreciation) for "Northern Runway" project from the start of construction.[11]
French Airports	All investments are included in the RAB as soon as the money is spent and not when they become operational. In addition further pre-financing is allowed if the investment is equivalent to more than 20% of total turnover of the airport.
Other UK regulators	
UK Water (Ofwat)	Ofwat's totex approach allows companies to vary capitalisation rates thereby allocating recovery across user groups. Ofwat explicitly allows the Thames Tideway Tunnel (a major one-off investment project) to charge customers during construction through an asset base and liquidity allowance.
Energy Networks (Ofgem)	Ofgem's expenditure-based totex approach allows companies to recognise expenditure when it is spent rather than when the relevant asset is operational. Moreover, networks can vary capitalisation rates.

The remainder of the report is structured as follows:

- Chapter 2 discusses how investment in competitive markets can be financed by "scarcity rents" when investments are lumpy and / or with long lead times;
- Chapter 3 discusses the extent to which it is efficient to apply the same principles to infrastructure investment at regulated airports;
- Chapter 4 discusses regulatory practice with regard to pre-financing.

[11] The CAR (regulator of Dublin Airport) also applies a "sculpted depreciation" approach which (after completion of the asset) allocates more of the recovery of the capex to later years relative to a standard straight-line depreciation profile. The combined effect of pre-funding and sculpting deprecation is an earlier start to recovery followed by slower recovery in the middle, before a "catch-up" towards the end.
The proposed profile differs from CAR's past approach for Terminal 2, see chapter 4.1.2 for details.

2. The Theory of pre-funding Investments

2.1. Pre-funding Is Consistent with Competitive Market Outcomes

The CAA has correctly recognised that pre-funding as an outcome of scarcity prices is consistent with competitive market outcomes.[12] As the CAA states:

> *In a simple supply and demand model of a competitive market, if capacity were insufficient to meet demand, **prices would rise until demand had been priced off such that available supply or capacity could serve that demand**. That is to say, the "scarcity price" can be a signal for increasing output/investment. If a market participant had the ability to expand, creating new capacity with a lower unit cost than current 'scarcity prices', then it would have an incentive to build this capacity, so long as the perceived value of future gains exceeded the perceived costs. The effect of this expansion of supply would be to enable more demand to be served, reducing prices to a new market-clearing point. The extent to which prices fall depends on the gradient of the demand curve.*
>
> *In many markets this process (capacity expansion) happens in small increments, such that investment is made along with demand growth and prices do not rise, and/or participants plan and invest ahead of demand growth. If expansion was likely to arrive in a large "lump", however, prices might rise significantly before a new investment was made.*

The CAA's view of how competitive markets work and how they support pre-funding illustrates that when markets are competitive, the equilibrium price that clears demand given the available supply of output reflects the marginal cost of producing one extra unit of that output.[13]

In the short term, while capacity (and therefore maximum output) is fixed, the market-clearing price (scarcity price) reflects the *short-run marginal costs* (SRMC) of meeting the last incremental unit of demand.[14] By contrast in the long-term, i.e. when capacity expansions are allowed to adjust to meet the long-run level of demand, the price reflects *the long-run marginal cost* (LRMC) of meeting demand when all outputs vary. A fundamental result from competitive markets theory is that the long-run competitive market equilibrium results in that level of prices which corresponds to the LRMC of the most expensive capacity provider (or cheapest new entrant) needed to satisfy incremental demand.

Figure 2.1 illustrates the mechanism by which prices adjust in a market with "lumpy" capital expenditures (such as airports) resulting in a step-wise supply schedule:

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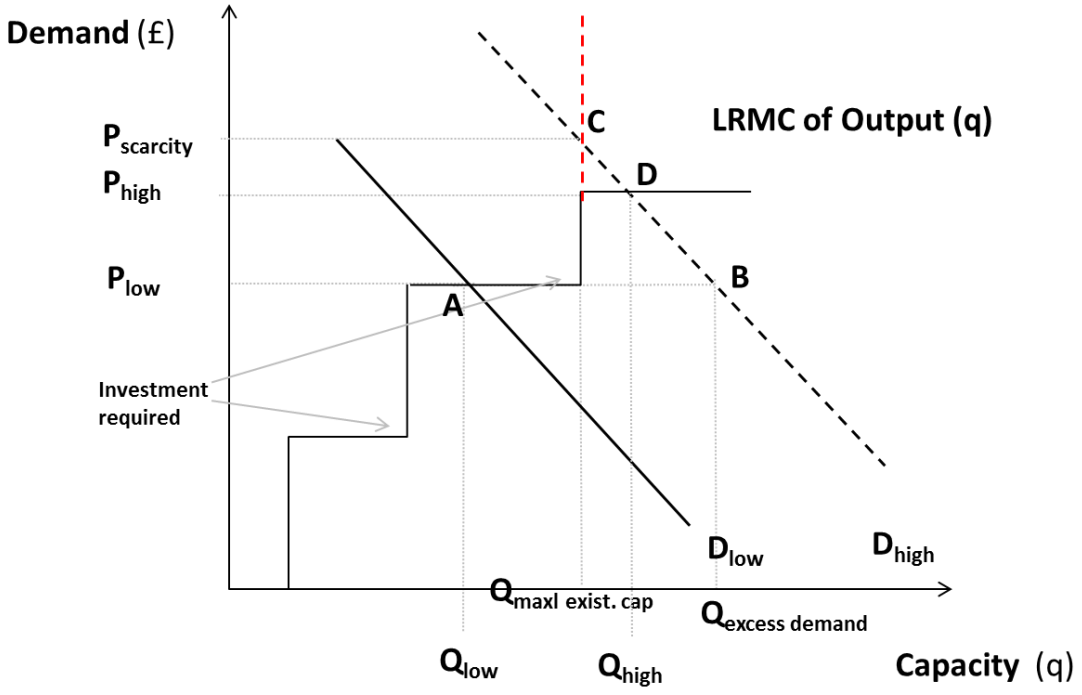
[12] Civil Aviation Authority, CAP 1221 (Oct 2014): Economic regulation of new runway capacity – a draft policy, p24-25.

[13] For reference, see any standard microeconomics textbook, e.g. Estrin S and D Laidler, Introduction to Microeconomics.

[14] Ibid. In perfectly competitive markets, it can be shown that competitive firms choose such level of output such that average cost = marginal cost = optimal point of production.

- As a starting point, **point A** on Figure 2.2 shows the market clearing price P_{low}, which clears demand given the current level of capacity. The current level of capacity enables that a maximum output of $Q_{max \mid exist. cap}$ is supplied on this market.
- Figure 2.1 then shows how the market would adjust under a demand expansion to say D_{high}. In this case, shown in **point B** the new demand level at the previous equilibrium price P_{low} cannot be satisfied under the given capacity constraints which only allow a maximum $Q_{max \mid exist cap.}$ to be supplied. Heathrow Airport is currently in such a situation where capacity is insufficient to meet demand.
- Because demand outstrips capacity significantly, end user prices are bid upwards for the given capacity installed. This drive results from the fact that only the highest bidders on this market are able to obtain any output, at the resulting equilibrium price $P_{scarcity}$, illustrated in **point C** in Figure 2.1, which represents the SRMC of satisfying demand when installed capacity is fixed.[15]
- When prices rise sufficiently and markets are competitive, however, the scarcity signal embedded in this higher price incentivises new capacity, because higher prices make new and more expensive supply projects viable. In Figure 2.1, this is illustrated as the equilibrium outcome in **point D,** where prices settle at the new level $P_{high,}$ which covers the LRMC of the new capacity expansion project, with an output level $Q_{high.}$

Figure 2.1
LRMC Equilibrium with Lumpy Capex Investments



Source: NERA Analysis

[15] See chapter 3.1 for a discussion of who is likely to appropriate these scarcity prices at Heathrow.

Consequently, competitive markets will tend to produce situations where charges first reflect SRMC highlighting the scarcity of the good in demand before new entrants enter the market and bid the price back down to the LRMC. The perfectly competitive market outcome is therefore that level of prices which allows entry and cost recovery of the cheapest new entrant, or capacity provider, required to satisfy the market-clearing demand in the long-term.

2.2. Pre-funding as an Approximation of LRMC Pricing in the Regulatory Context

Since regulation is intended to mimic competitive markets, to the extent that the competitive outcome maximises social welfare[16], a body of regulatory literature has covered ideas of introducing "long-run marginal cost pricing" in the regulation of long-lived assets. [17, 18]

By charging users for the cost of known future investments to meet expected supply, LRMC pricing does entail pre-funding. The key conceptual advantage of LRMC approaches over standard RAB-based approaches to determining infrastructure charges is that they capture the scarcity value of the service the asset provides rather than merely the cost associated with the asset and therefore provide efficient price signals to users.

However, there are practical problems in switching to full LRMC pricing given that there is significant uncertainty about how to estimate LRMC and that it does not ensure cost recovery for existing assets (but may rather over- or under-price them).[19] These were behind the CC's decision from the Stansted 2008 enquiry to continue to use cost-based regulation with pre-funding, which mimics an LRMC system to an extent.[20]

2.3. Conclusion

Pre-funding is consistent with both competitive market outcomes and good regulation. Competitive markets incorporate scarcity rents in the market clearing price when the market is under capacity constraints. When markets are competitive without barriers to entry, these scarcity rents attract new entrants whose projects become feasible under the new, higher prices – a process which ensures that in the long-term, prices reflect the LRMC of capacity provision. Regulators have generally incorporated this long-run view in RAB -based approaches to regulation with pre-funding (as we show in chapter 4) as pure LRMC pricing is difficult to implement in practice.

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16 This result is the First Fundamental Theory of Economics – for reference see any standard microeconomics textbook.

17 The literature discusses two options for LRMC estimation, i) the Turvey approach, which most closely approximates the marginal costs because the cost estimate represents the change in costs as a result of a specified change in demand and ii) the AIC approach, on the other hand, uses the average costs of future increases in demand as an approximation for the costs of providing an additional unit of the service.

18 See the seminal work by Bonbright, James C. et al. Principles of Public Utility Rates.

19 See e.g. Competition Commission (2008): Reference Stansted Airport Ltd – Q5 price control review, Appendix C: Regulatory Options and Beckers et al. (2010): Entgeltregulierung der deutschen Flughäfen Reformbedarf aus ökonomischer und juristischer Sicht (in German), p.31.

20 See Competition Commission (2008): Reference Stansted Airport Ltd – Q5 price control review, Appendix C: Regulatory Options

Independent of the practicalities of using LRMC pricing the body of theoretical literature behind it supports the CAA's view that pre-funding through increased prices before completion of the asset is a feature of competitive markets and efficient regulation.

3. Pre-funding Airport Investments lowers Costs for Users

3.1. Scarcity Charges and Pre-funding for regulated Airport Assets

Below we show that tying airport charges strictly to the costs of *current* infrastructure by not allowing "pre-funding" is not in the interest of users overall when the airport is capacity-constrained.

Above we established that in competitive markets prices can reflect scarcity values, especially when investments are lumpy, i.e. either cannot be sized to fit small changes in demand or take a long time to implement. Standard economic regulation removes the regulated company's ability to capture the scarcity value by limiting the return it is able to achieve to its cost of capital. However, this does not necessarily mean that final customers are protected from paying for the scarcity value if scarcity prices can still be charged (even in the absence of pre-funding) by the non-regulated segments of the supply chain – the airlines.

There is strong evidence that while regulated airport charges are significantly below market prices at Heathrow,[21] passengers do nonetheless pay scarcity rents at capacity constrained airports in general[22] and at Heathrow in particular, which are appropriated by the airlines.[23] Consequently, the prices that final users pay reflect short-run scarcity prices (point C in Figure 2.1) even when there is no pre-funding and airport charges are kept low by regulation.

In this case, "pre-funding" in a way that mimics the competitive situation is likely to be in the interest of final users as scarcity charges that final users will inevitably pay when capacity is constrained will at least be used to finance airport capacity and to reduce future charges rather than being appropriated by airlines.[24]

3.2. Economic Benefits of Pre-Funding Airport Investments

In light of the regulatory role in ensuring that passengers overall receive airport services at efficient costs, pre-funding that reflect scarcity prices also has a role to play in regulated infrastructure investment for a number of reasons:

- Pre-funding can be used to pay for a greater share of lumpy investments when capacity is scarce and thereby reduce the revenue requirement and thus charges per user when

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21 Civil Aviation Authority CAP 1221 (Oct 2014): Economic regulation of new runway capacity – a draft policy, page 26.

22 Beckers et al (2010): Entgeltregulierung der deutschen Flughäfen Reformbedarf aus ökonomischer und juristischer Sicht (in German), p. 95; in a paper actually supported by the German airlines association (BDF). https://www.wip.tu-berlin.de/fileadmin/fg280/forschung/publikationen/2010/studie_entgeltregulierung_der_deutschen_flughaefen-v3.00_01.03.2010.pdf

23 Frontier Economics (2014): Impact of airport expansion options on competition and choice

24 When airports capacity is scarce and slot allocations are grandfathered rather than regularly auctioned; airlines in possession of slots can appropriate the full rent associated with scarce capacity by charging the maximum final users are willing to pay before demand falls below the level where capacity is no longer scarce.
Given that airlines are acting as a quasi-monopolist supplying a fixed amount of demand that can be serviced any per passenger airport charges are likely to be viewed as quasi-fixed. Consequently, any change in airline cost (e.g. airport charges) is unlikely to be passed through to final consumers by rational airlines when they are acting as a quasi-monopolist in times of scarce capacity.

capacity is relatively abundant after completion of the lumpy investment. By levying comparatively lower charges when additional demand can actually be accommodated and when there is competition for landing slots pre-funding improves expected utilisation.

- Allowing the airport operator to use pre-funding to finance the airport will reduce airport financing costs overall by reducing the duration[25] of financing needs due to increased cash flow in the early years, which is set to improve credit profile and financeability. Consequently, overall capital costs borne by users over the life of the asset are likely to be lower.

We discuss both these points in more detail below.

3.2.1. Improved Utilisation

A key issue for any infrastructure investment with potentially volatile demand (such as airports) will be to maximise utilisation of the asset in order to reduce the cost per user. In this context pre-funding of new infrastructure at Heathrow is consistent with the economic concept of "Ramsey pricing", i.e. the idea that a monopolist serving customers in different markets should charge more to those with more inelastic demand and less to those with more elastic demand in order to recover its revenue requirement with the lowest possible impact on overall demand. For HAL these two "markets" are i) the phase before new capacity comes online (where there is inelastic demand) and ii) the phase after new capacity comes online (where demand can be expected to be more elastic).

In deciding how to allow HAL to recover the cost of the investment the CAA will need to determine charges for both these "markets." Pre-funding efficiently allocates more of the revenue requirement to the "market" where demand is more inelastic.

Increasing airport charges when there is excess demand that cannot be serviced with the available capacity will increase cash flow to the airport operator without reducing final user demand.[26] Such a pricing structure ensures that the scarcity rent, which is going to be extracted from final users in any case where capacity is constrained (see chapter 3.1), is re-invested into airport infrastructure rather than being appropriated by the airlines.[27]

By adjusting the charging profile for the airport to recover a larger share of the investment when capacity is scarce will lead to relatively lower charges when there is spare capacity after completion of the investment, which will benefit final customers in two ways:

Firstly, lower airport charges after completion of the new investment (relative to a situation where there is no pre-funding) are likely to improve utilisation of the airport by making more

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[25] Investors require a term premium for lending to any company or other entity. In this context the duration of a financing instrument is a similar concept to the more commonly used one of "maturity." While maturity refers to the time until the last instalment is paid back, duration refers to the (discounted) weighted average time till repayment. Hence while pre-funding does not necessarily reduce the maturity of the investment, it is likely to reduce the duration, which will make investors more willing to provide finance.

[26] See footnote 24.

[27] Given that the CAA will only allow HAL to recover its costs, increasing charges in one "market" will reduce charges in the other while airlines are free to use the gains from scarcity rents in whatever way they want.

new routes commercially viable at the margin, which will benefit all airport users through lower average charges as the fixed costs can be spread over higher passenger numbers.

Secondly, airlines are more likely to pass through lower airport charges to final users in a situation where there is increased competition for passengers wanting to fly from Heathrow due to spare runway capacity, again leading to further increases in passenger numbers and thus airport utilisation, which will in turn reduce costs per passenger.

3.2.2. Lower overall Financing Costs

Additionally, advancing revenues ("pre-funding") is likely to be economically efficient because of its impact on the overall financing costs of the asset independent of its impact on utilisation. Given the capital-intensive nature of the airports business financing costs reflect a key driver of total costs as reflected by the Airport Commission's advisers:

> *"debt finance would be a critical element of any private strategy. (...) this financing would far excess the capacity of the bank debt market for short-term construction finance (...). Bond financing would therefore be the most significant element of any debt financing strategy (...) [however]... can be difficult to finance without some form of pre-funding or 'profiling' of revenues."*[28]

There are a number of ways in which pre-funding lowers financing costs, namely:

- It reduces demand risk by recouping a larger amount of total required revenues when demand is inelastic (in times of a capacity constraint) and less when demand is more elastic (after completion of the new capacity);
- It increases the size of the revenue allowance compared to capex cash outflow, which reduces the volatility of free cash flow in response to cost shocks; and
- It improves financial ratios by allowing companies to recover a larger portion of financing cost earlier thereby improving debt/ assets, interest cover and debt service coverage ratios, which are indicators of the likelihood of failure.

The above elements are all captured in rating agency Moody's assessment of company risk for airports, which it uses to determine allocating credit ratings, which then in turn largely drive (debt) financing costs. Moody's uses amongst other others: [29]

- Complexity of Airport Capital Expenditure Programme, which highlights the additional risks brought by the expansion proposals;[30]
- Volatility of Annual Passenger Growth Rate, which should be reduced by pre-funding that brings smoother tariffs;[31] and

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[28] KPMG, Airports Commission, Interim Report, High-level Commercial & Financial Assessment of Selected Potential Schemes, 10 December 2013, p. 5.

[29] Moody's (2008): Credit Rating Methodology - Operational Airports outside of the United States. The high level criteria are: 1. Governance & Rate Setting, 2. Market Position, 3. Passenger & Airline Base, 4. Operating Environment & Capital Programme, 5. Stability of Business Model & Financial Structure, 6. Key Credit Metrics

[30] Factor weight: 5%

[31] Factor weight: 3.33%

- Financial ratios such as cash interest cover, FFO/debt, debt service cover ratio, which should be improved by earlier cash flow from investment.[32]

By bringing down these key risk factors pre-financing will improve the score assigned by rating agencies such as Moody's and therefore reduce overall financing costs that have to be borne by users.

3.3. Conclusions

In addition to being consistent with the outcomes of competitive markets and good regulation (see chapter 2) pre-funding is likely to bring a number of economic benefits in the case of Heathrow:

- Pre-funding is likely to increase utilisation of the new capacity because it allocates more of the revenue requirement to times when capacity is scarce and hence demand is inelastic while lowering prices when there is spare capacity. Such a pricing scheme is consistent with "Ramsey pricing", a standard economic technique for allocating charges to different markets;
- Pre-funding is likely to reduce overall financing cost by i) reducing demand risk, ii) increasing the revenue allowance compared to cash outflow from capex and thus reducing the volatility of free cash flow in response to cost shocks and iii) maintains or improves financial ratios, which are used by rating agencies to assign credit ratings.

[32] Total factor weight of four financial ratios: 40%.

4. Regulatory Practice supports Pre-Funding

As discussed above, pre-funding in the context of regulated infrastructure relates to allowing regulated companies to recover part of the cost of future / on-going investments from current users before the assets become operational. In this section, we discuss cases from the airport sector and other regulated infrastructure, where models of pre-funding have been allowed.

4.1. Examples of Charging Principles in the Airport sector

4.1.1. Previous CAA Practice – Heathrow Terminal 5

Heathrow's Terminal 5 (T5) project parallels the case in point due to its single asset nature and requirement for large upfront capital expenditure (c. 4.3bn[33]). In the case of T5, the CAA allowed a pre-funding solution which included the following two components:[34]

- Firstly, over Q4 the CAA allowed a cumulative price profiling adjustment of GBP 436.367 million in 2000/2001 prices split into (unequal) annual amounts between c. GBP 43.5 million in FY 07/08 and c. GBP 135.5 million in FY 03/04[35] in order to improve financeability and to smooth the price path.[36] This approach effectively allowed BAA to begin earning a return and depreciation on (a portion of) project capex incurred during the construction period, before the T5 project was complete and operational.[37] In order to maintain incentives for BAA to deliver on time the CAA also introduced "capex triggers", i.e. penalty conditions that limited price increases in case certain milestones were not delivered on time;[38]
- Secondly, the CAA allowed BAA to earn a higher rate of return on the whole asset base than would have been implied by comparator estimates not undergoing a similar investment programme.

BAA offered two reasons for revenue advancement, which were accepted by the CAA:

- First, BAA argued that advancement of revenues was necessary in order for it to maintain its financeability position during the construction period; and
- Second, BAA argued that absent revenue advancement would create a large one-off increase in charges. The price increase was estimated by the CC which found that

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33 Competition Commission (Sep 2007): A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd), Appendix D: Capital investment and construction inflation , page D3

34 House of Commons transport committee (May 2013): A10 Pre-funding of aviation infrastructure via charges

35 See CAA (Feb 2003): Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003 – 2008, CAA Decision – Annexes, Annex 6.1.

36 See CAA (Feb 2003): Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003 – 2008, CAA Decision, Paragraphs 4.11 through 4.28.

37 This portion exceeded the allowance already available under the CAA's policy towards allowing for remuneration of assets in the course of construction (AICC).

38 The following milestones were determined: 2003 – Earthworks complete; 2004 – First four stands operational Rivers diverted; 2005 – Control tower completed; 2006 – Terminal weather-tight; Satellite weather-tight; 2008 – Terminal completed.
The CAA describes the mechanics of the triggers in detail in Annex 9 in the Q4 decision.

including the full capex cost (c. £4.3bn) at the end of the construction period into the RAB would results in a c. 80% increase in airport charging fees.[39]

In its final decision the CAA accepted the CC's arguments that pre-funding was an efficient way of realising T5 and set out a revenue advancement profile according to which BAA would be allowed to increase airport charges; subject to a number of capex triggers.

4.1.2. The Case of Dublin Airport

At the latest (2014) price control review of Dublin Airport Authority's (DAA) airport charges, the Commission of Aviation Regulation (CAR) similarly allowed pre-funding for delivery of the Northern Runway "trigger" project (the Northern Runway). The project involves the potential building of a new runway at Dublin Airport, at an expected (allowed) cost of €246.9m, covering the costs of planning, design, preparation and construction.[40,41]

It is as yet unclear whether the Northern Runway project will go ahead as the construction of the runway is linked to passenger numbers at Dublin Airport exceeding 25m in the 12-month period preceding the price cap year.[42] In the event that the Northern Runway is triggered, CAR calculated an increase in the price cap of €0.59 per passenger, which reflects the depreciation and return on the full estimated project capex of 246.9m in a set of (equal) payments (annuity) over a 50-year period. Since the full capex cost, including the cost of the runway, is levelised over a period of 50 years, and this calculated cost increment per passenger is added to the price cap as soon as the project is triggered (i.e. enters planning and construction phase), the price cap effectively advances revenues during the construction phase of the project.

The CAR then applies "sculpted depreciation" to the runway RAB, which uses an annuity calculator to evenly allocate return and depreciation of the capex over the 50-year asset life.[43] Compared to a standard straight-line depreciation approach, sculpting depreciation delays cash flow. The combined effect of pre-funding and sculpting deprecation is i) an earlier start to recovery (due to pre-funding) but ii) slower recovery in the middle (due to sculpted deprecation) followed by iii) "catch-up" to full recovery towards the end of the asset life.

The proposed approach for the Northern Runway provides for faster cost recovery compared to CAR's previous practice for Dublin Airport Terminal 2 where capex was back-loaded in line with expected passenger growth under a so-called unitised approach while some

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[39] House of Commons transport committee (May 2013): A10 Pre-funding of aviation infrastructure via charges, footnote 342: The CC calculated that a one-off price adjustment of approximately 80% would be needed when T5 commenced operations with no revenue advancement. (Competition Commission (Nov, 2002), BAA plc, report on the economic regulation of the London airport companies, page. 317, para 10.38.)

[40] Ernst Young (Sep 2014): Dublin Airport Capital Expenditure Assessment: Report to the Commission for Aviation Regulation, page. 76.

[41] Commission for Aviation Regulation (Oct 2014), Maximum Level of Airport Charges at Dublin Airport 2014 Determination

[42] Commission for Aviation Regulation (Oct 2014), Maximum Level of Airport Charges at Dublin Airport 2014 Determination

[43] See Commission for Aviation Regulation 2014 Final Determination Financial Model here: http://www.aviationreg.ie/regulation-of-airport-charges-dublin-airport/2014-determination.576.html

remuneration was held back in its entirety. As recovery is based on an assumed profile of passenger growth over time that did not materialise in the case of T2, the unitised approach pushed back cash flow and added uncertainty to remuneration. CAR's decision to move away from a unitised and towards an annuitised approach with pre-funding moves cost recovery forward to a significant extent.

4.1.3. The Case of French Airports

The regulatory system for French airports also includes pre-funding mechanisms, namely:

- The inclusion of assets under construction in the Regulatory Asset Base; and
- A special mechanism for pre-funding large investments

Regulatory Asset Base includes assets under construction

The 2005 decree[44] which governs current airport economic regulation in France states that "*in addition to the expenses associated with investments already made, expenditures for airport infrastructures or facilities under construction can be taken into account for the determination of airport charges*". The airports can thus choose to include all non-operational assets under construction in the Regulatory Asset Base, and in practice all airports regulated under an economic regulation contract have chosen to do so (Paris, Toulouse and Lyon airports). Amortisation (and deduction from the RAB) begins only the year the asset becomes operational.

Specific pre-funding rule for large investments

The 2005 decree also provides for the ability to pre-fund large investments, on top of the ability to include them in the RAB during construction: "*when their importance warrants it, future expenditures related to the construction of certain infrastructure or facilities can be taken into account if the start of construction is scheduled within a maximum period of five years*". For pre-funding to be approved the airport must provide a detailed estimate of the investment, its expected cost and an economic study of the impact of higher regulated charges on users.

The decree is complemented by a September 2005 ministerial order[45] relative to airport services, which states that the pre-funding cannot apply to an investment (or several linked investments) which account for less than 20% of the revenues of the regulated till of the airport for the last known year. Any pre-funding is to be deducted from future revenues during the amortisation period (it can also be deducted over a shorter period than the amortization period).

The rationale behind the pre-funding possibility was to reduce financing costs and enable airports to spread the cost of very large investments between current and future users so as to prevent sudden increases to regulated charges when they are included in the RAB. However,

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[44] Décret n° 2005-827 du 20 juillet 2005 relatif aux redevances pour services rendus sur les aéroports

[45] Arrêté du 16 septembre 2005 relatif aux redevances pour services rendus sur les aérodromes

no airport has relied on this specific pre-funding possibility since it was included in the law in 2005, as prefunding through inclusion in the RAB of assets under construction has proven sufficient to undertake current and past investment programs.

4.2. Examples of Charging Principles in Other Sectors

Pre-funding has also been applied by regulators in other regulated infrastructure sectors where large capex projects have to be undertaken.

4.2.1. Ofwat - Thames Tideway Tunnel

The Thames Tideway Tunnel (TTT) Project is a recent case in point of a large capital expenditure project (£4.2bn)[46] with a long lead time (seven years of construction before becoming fully operational). [47] Ofwat has therefore adapted its regulatory framework to support the Infrastructure Provider (IP) for TTT in financing the construction of the Project at an efficient cost to customers. A key element of this adaptation has been to entitle the IP to earn revenues as soon as construction begins.[48]

The IP's allowed revenues during the construction period are calculated by reference to a number of building blocks, including the Return on Capital building block and a Liquidity building block:

- *The Capital building* block allows a return on the RCV, which sums the capex incurred up to the start of the charging year in question, and a forecast of capex for the charging year. The allowed return is determined as the bid WACC of the winning infrastructure provider (BWACC).[49]
- *The Liquidity building block* is justified by the fact that the IP may need to draw down funding for future spend as well as current spend, to ensure that certain liquidity requirements are met. The liquidity allowance therefore provides a return on the following Charging Year's expected spend to compensate for the financing cost of drawing down funding early. It is calculated by BWACC times the difference between the forecast average RCV for the following Charging Yearand the average RCV in the Charging Year in question, effectively allowing a return on the one-year forward RCV.[50]

The building block allowance in the case of TTT therefore advances a return allowance on the built-up asset base (RCV) to date including one year future forecasts but does not include a depreciation allowance on the RCV. Whilst not fully "carved out", the IP will be able to

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46 Expected, 2011 prices. See Thames Tideway Tunnel Proposed solution, accessed at: http://www.thamestidewaytunnel.co.uk/the-project/proposed-solution

47 See Thames Tideway Tunnel timeline and proposed solution at http://www.thamestidewaytunnel.co.uk/the-project/timeline and http://www.thamestidewaytunnel.co.uk/the-project/proposed-solution but excluding potential "major delays"

48 See Ofwat (Oct 2014): Consultation on the regulatory framework for the infrastructure provider for Thames Tideway Tunnel project: Annex 2: draft Project Licence explanatory memorandum

49 Thames Tideway Tunnel Draft Project Licence Annex 2: draft Project Licence explanatory memorandum, p. 4-5

50 Thames Tideway Tunnel Draft Project Licence Annex 2: draft Project Licence explanatory memorandum, p. 4 -5

realise these revenues via a Revenue Agreement with Thames Water, who will collect these charges from its customer base.

4.2.2. Ofgem – Transmission/ Distribution Assets vs. OFTO

Ofgem, the Energy regulator in the UK, pre-funds onshore transmission and distribution infrastructure investments by allowing companies to i) include expenditure in user charges when it is incurred rather than when the associated asset becomes operational and ii) by allowing companies to vary capitalisation rates, which allows companies some flexibility in charging current vs. future users.

We illustrate the functionality of both these schemes using the example of the transmission price control RIIO T1.[51] Ofgem adopts a "totex" approach in setting the revenue allowance where Totex is the total amount of forecasted expenditure for the year, i.e. Ofgem allows companies to charge customers as soon as the expenditure is incurred rather than only once the asset becomes operational.

Ofgem allows companies some further discretion over the relative charges to current vs. future consumers by dividing totex into "fast pot" and "slow pot" money based on a regulatory capitalisation rate. While "fast pot" money is recovered in year, "slow pot" money goes into the RAB and is recovered over the regulatory asset life of 45 years. By lowering the capitalisation rate, companies can recover a larger share of on-going investments from current users, e.g. to overcome financeability constraints. In practice, most network operators have used capitalisation rates closely matching actual capex spend.

However, the above mechanisms do not apply for offshore transmission assets, which are not regulated under the standard Ofgem regulatory system. Instead potential investors are asked to bid for a fixed 20 year revenue stream that will allow them to recover capital expenditure and interest incurred on capex but which will only allow them to start charging after completion of the asset. [52]

4.2.3. Ofcom LRIC

Ofcom and the European Commission use a variant of LRMC pricing (Lon-Run Average Incremental Cost – LRAIC) to determine the charges for various regulated telecommunications products.

In principle the charges for the incumbents' existing networks should be based on the LRMC of a *hypothetically efficient new entrant's network* in order to encourage entrants to make efficient decisions about whether to build their own infrastructure or rent the incumbent's network. There is no obvious theoretical link between the incumbent's charges and its ability to recover the cost of the existing network as the hypothetically efficient network could include either significant efficiency improvements and / or new investments required to satisfy future demand not embodied in the old network.

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[51] The same general approach applies for the electricity networks (RIIO-ED1) and gas distribution networks (RIIO-GD1).

[52] Ofgem (December 2013): Offshore Transmission OFTO Revenue Report:https://www.ofgem.gov.uk/ofgem-publications/85237/es822-offshore-ofto-revenue-report-1-web.pdf

However, in practice both network design and the average cost of new investment are likely to be strongly driven by the information the regulator can obtain from the incumbent company thus moving the approach closer to RAB-based pricing than it might first look.

Moreover, it is worth noting that most regulators have implemented this pricing scheme for existing networks with limited new investments while it has generally not been used for large investment projects such as new fibre networks. As such it provides only relatively limited comparable evidence.

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Annex 4: Heathrow's comments on Risk/WACC

Annex 4

Risk/WACC

Overview of a potential regulatory framework for airport capacity expansion (at Heathrow)

Heathrow, along with many other UK companies under economic regulation, is subject to price control. This is set to give investors an expectation of earning the appropriate rate of return (Weighted Average Cost of Capital - WACC) to be earned on a Regulated Asset Base (RAB) over a multi-year period. For airports this period is five years, but for other sectors this varies from three years (telecoms networks), to five years (water companies), to eight years (energy networks).

To date, this model has been viewed as generally successful in various regulatory sectors:

- The multi-year price cap strikes a balance between protecting consumers and providing companies with an incentive to seek cost efficiencies and additional revenue opportunities within the price control period
- The RAB provides investors with a degree of assurance that regulators will honour investments – albeit with the WACC earned on the RAB adjusted in each price control period to reflect the regulator's view of the opportunity cost of capital to investors.

The RAB has allowed companies to finance asset investment programmes using relatively low-cost investment grade debt. Without the concept of the RAB, borrowing costs would likely be higher, with companies having to resort to more expensive equity financing. Consequently, it is reasonable to assume that without the RAB model, prices to consumers would be higher.

As the Commission says, changes will be required to the system governing the economic regulation of airports to support the delivery of long-term options. Even the current regulatory settlement does not encourage the company to invest in the existing two runway airport. Investment in a third runway and the related infrastructure will magnify the risk to investors:

- New runway capacity will require a wave of new investment with a long payback period – significantly increasing the average asset life at Heathrow

- Construction phase risk:

    - The construction period of around 15 years increases risk relative to the airport's current capital programmes, particularly with regard to issues such as cost overruns and delays
    - Any lack of return from these assets during the construction phase will also add further to risk

- Operational phase risk:

    - Operational cost risk - e.g. under-estimation of the running costs of the new facility
    - Commercial revenue risk - e.g. new passengers may be lower spending
    - Traffic volume risk given the uncertain speed (ramp-up) and level of take-up of new capacity and potential greater volatility of incremental traffic

- Financing risk: airport expansion will require an unprecedented scale of access to UK and international bond markets for a privately-financed transport infrastructure business. It will be initially unclear what depth the UK corporate bond market has to meet this demand, and what returns will be required on this debt and supporting equity
- Regulatory risk, including: apparently arbitrary decisions by the regulator to reduce the WACC in future price control periods or impose RAB write-downs.

The length of the investment payback period magnifies each of these risks - particularly the regulatory risk after the investment has been made. The Airports Commission should be aware that these issues are not unique to expansion at Heathrow. They would apply equally, if not more so, to Gatwick, and would be extreme in the case of a new build airport in the Thames Estuary. These risks are more easily managed by the airport and airlines within an expanded existing hub airport at Heathrow than they would be at any other location.

The stabilisation period

At the point at which investment is committed, Heathrow will enter a period of heightened risk for all the factors listed above (and possibly others), requiring measures by the regulator to mitigate this level of risk. This period will start from the point of committing the first significant investment, for at least 15 years. This is roughly the period for construction and for operational, commercial revenue and aeronautical revenue risk to become clear, although the average asset life will be longer. We refer to this time as the 'stabilisation period'. This stabilisation period in particular will require a fundamental change to the approach of regulation to mitigate the heightened risk to providers of capital.

The stabilisation period will be a significant challenge for financing the project. Under the existing regulatory model, all risk is borne by the airport for the full five years of each regulatory period. Since risk will increase as described above, a reallocation of risk between airport and airlines must take place in order to achieve an acceptable balance.

These concerns affect how the existing regulatory regime should be adapted. In order to allow investment, we believe that the regulatory environment needs to include a number of commitments:

- Retention of RAB based regulation
- A guarantee that all efficiently incurred capital expenditure (including development costs) is included in the RAB, with safeguards to prevent write-downs
- Clarity and necessary assurances that surface access infrastructure outside the airport would be funded by the Government
- Recognition that long term investment in major new airport infrastructure requires greater certainty on the long term return to shareholders, with implications for the structure of the regulatory period
- A mechanism to provide investors with a longer visibility horizon for the WACC
- Adoption of a higher WACC to cover the additional risks of capacity expansion
- Mitigation of the heightened risk to the airport with additional measures. These could include revenue and cost risk sharing between the airport and the airlines.